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EXAMINER
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DUONG, KHANH B

ART UNIT	PAPER NUMBER
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2822

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/771,277	<b>Applicant(s)</b> YAMAZAKI ET AL.	
	<b>Examiner</b> KHANH B. DUONG	<b>Art Unit</b> 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6, 10, 11, 14-21, 23, 24, 27 and 28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2, 3, 5, 6, 14, 15, 17, 18, 20, 21, 27 and 28 is/are allowed.
- 6) ☒ Claim(s) 1, 4, 10, 11, 16, 19, 23 and 24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

This office action is in response to the amendment filed January 9, 2008.

Accordingly, claim 7 was cancelled, and claims 1-6, 10, 11, 14, 15, 17, 18, 20, 21, 27 and 28 were amended. Claims 8, 9, 12, 13, 22, 25 and 26 were previously canceled.

Currently, claims 1-6, 10, 11, 14-21, 23, 24, 27 and 28 remain pending.

### ***Response to Arguments***

Applicant's arguments with respect to the amended claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 1, 4, 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatta et al. (U.S. 20020022364 A1) in view of Kweon et al. (U.S. 6,782,928), Ogawa (U.S. 6,871,943) and Koinuma et al. (U.S. 5,549,780) .**

Hatta et al. ("Hatta") discloses in FIGs. 1-5 a manufacturing method of a display device comprising: selectively forming a resist pattern 30 comprising a composition which is emitted by use of droplet emitting means (a spin coater) over a substrate; baking the resist pattern 30; carrying out plasma processing to the baked resist pattern 30 by use of plasma processing means, wherein the droplet emitting means comprises an inherent droplet emitting head for dispensing the resist composition. See page 3, paragraph 0030, and page 4, paragraphs 0040-0043.

Re claim 1, Hatta fails to disclose: a substrate having a size of 1000 x 1200 mm<sup>2</sup> or larger; the droplet emitting head comprises a plurality of droplet emitting holes being disposed in a line form; and the plasma processing means comprises plasma generating means under 5 Torr to 800 Torr.

Kweon et al. ("Kweon") teaches using glass substrates having an area up to 1000x1200 mm<sup>2</sup> or more to fabricate LCDs. However, Kweon does not mention a droplet emitting head comprises a plurality of droplet emitting holes being disposed in a line form; and a plasma processing means comprises plasma generating means under 5 Torr to 800 Torr.

Ogawa, on the other hand, expressly shows in FIG. 13 a droplet emitting head 7 comprising a plurality of droplet emitting holes (“ejection nozzles”) 138 disposed in a line form, wherein the droplet emitting head 7 is used for selectively forming metal wiring and resist patterns (see col. 18, lines 14-53; col. 7, line 65 to col. 8, line 5; col. 8, lines 15-22; and col. 31, lines 18-32 and 43-53). However, Ogawa does not teach using atmospheric plasma processing means to perform the steps of ashing and etching, wherein the atmospheric plasma processing means comprises plasma generating means under atmospheric pressure or vicinity of atmospheric pressure.

Koinuma et al. (“Koinuma”) teaches that etching at atmospheric pressure (inherently 760 torrs) adds the capability of etching a large area in an open system and does not require the evacuation of a chamber (see col. 3, lines 29-36 and col. 4, lines 34-42).

Since Hatta, Kweon, Ogawa and Koinuma are from the same field of endeavor, the purposes disclosed by Kweon, Ogawa and Koinuma would have been recognized in the pertinent prior art of Hatta.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of Hatta by employing a glass substrate having such a large size as taught by Kweon in order to efficiently process such substrate into individual LCD panels. In addition, it would have further been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of Hatta by using a droplet emitting head comprising a plurality of droplet emitting holes disposed in a line form as taught by Ogawa in order to selectively maximize the output of the droplets thus reducing manufacturing costs. In addition, it would have further been obvious to a person of ordinary skill in the art at the time the

invention was made to modify the method of Hatta by ashing or etching under the atmospheric pressure as suggested by Koinuma because of the desirability to ash or etch a large area in an open system without the burden of having to evacuate a chamber.

Re claim 4, see discussion above regarding claim 1.

Re claim 16, see discussions above regarding claim 1. Thus, Hatta discloses the droplet comprises a photosensitive resist while Ogawa discloses the droplet comprises a photosensitive resist and a metal material in liquid form.

Re claim 19, see discussion above regarding claim 16.

**Claims 10, 11, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takiguchi et al. (U.S. 6,228,465) in view of Kweon and Ito et al. (U.S. 6,231,917).**

Takiguchi et al. ("Takiguchi") expressly discloses in FIG. 5A-5C a manufacturing method of a display device comprising: forming a groove 8 in an insulating film 3 formed on a glass substrate 1; emitting a wiring material in the groove 8 by plating or burying to form a wiring 7 in the groove.

Re claims 10, 11, 23 and 24, Takiguchi fails to disclose: the glass substrate having a size of 1000 x 1200 mm<sup>2</sup> or larger; and using a droplet emitting means to emit the composition, wherein the droplet emitting means comprises a droplet emitting head in which a plurality of droplet emitting holes are disposed in a line form, wherein the droplet emitting head moves along the groove when emitting the wiring material.

Kweon et al. ("Kweon") teaches using glass substrates having an area up to 1000x1200 mm<sup>2</sup> or more to fabricate LCDs. However, Kweon does not mention using a droplet emitting means to emit the composition, wherein the droplet emitting means comprises a droplet emitting

head in which a plurality of droplet emitting holes are disposed in a line form, wherein the droplet emitting head moves along the groove when emitting the wiring material.

Ito et al. ("Ito"), on the other hand, expressly shows in FIGs. 6, 15-19 and 34-37 using a droplet emitting means to emit a composition (e.g. SOG, resist or metal), wherein the droplet emitting means comprises a droplet emitting head 20 in which a plurality of droplet emitting holes 11 are disposed in a line form, wherein the droplet emitting head 20 moves along a groove ("depressed portion") when emitting the wiring material for the purpose of forming a film having a flat surface [see col. 20, lines 48-54.

Since Takiguchi, Kweon and Ito are from the same field of endeavor, the purpose disclosed by Kweon and Ito would have been recognized in the pertinent prior art of Takiguchi.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of Takiguchi by employing a glass substrate having such a large size as taught by Kweon in order to efficiently process such substrate into individual LCD panels. In addition, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method disclosed by Takiguchi as taught by Ito because of the desirability to selectively form a wiring film having a flat surface.

***Allowable Subject Matter***

Claims 2, 3, 5, 6, 14, 15, 17, 18, 20, 21, 27 and 28 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: none of the prior art of record, taken alone or in combination, fairly shows or suggests all the limitations in the claims.

Re claim 2, none of the prior art of record discloses the following limitations in combination with the rest of the limitations in the claims: selectively forming a pattern including a metal material by use of droplet emitting means; selectively forming a resist by use of droplet emitting means, over the pattern; etching the pattern by use of atmospheric plasma; and ashing the resist by use of atmospheric plasma processing means after etching the pattern, wherein the droplet emitting means comprises a droplet emitting head in which a plurality of droplet emitting holes are disposed in a line form.

Re claim 3, none of the prior art of record discloses the following limitations in combination with the rest of the limitations in the claims: selectively forming a pattern including a metal material by use of droplet emitting means; selectively forming a resist by use of droplet emitting means; etching the pattern by use of atmospheric plasma processing means; and ashing the resist by use of atmospheric plasma processing means, wherein the droplet emitting means comprises a droplet emitting head in which a plurality of droplet emitting holes are disposed in a line form.

Re claim 5, none of the prior art of record discloses the following limitations in combination with the rest of the limitations in the claims: selectively forming a pattern including a metal material by use of droplet emitting means; selectively forming a resist by use of droplet emitting means, over the pattern; etching the pattern by use of atmospheric plasma for carrying out local plasma processing; and ashing the resist by use of plasma processing means for carrying out local plasma processing, after etching the pattern, wherein the droplet emitting means comprises a droplet emitting head in which a plurality of droplet emitting holes are disposed.



Re claim 6, none of the prior art of record discloses the following limitations in combination with the rest of the limitations in the claims: selectively forming a pattern including a metal material by use of a droplet emitting means; selectively forming a resist by use of a droplet emitting means, over the pattern; etching the pattern by use of plasma processing means for carrying out local plasma processing; and ashing the resist by use of plasma processing means for carrying out local plasma processing, after etching the pattern, wherein the droplet emitting means comprises a droplet emitting head in which a plurality of droplet emitting holes are disposed.

Re claim 14, none of the prior art of record discloses the following limitations in combination with the rest of the limitations in the claims: wherein the source electrode and drain electrode are formed by: selectively forming a first pattern including a metal material by use of droplet emitting means; selectively forming a first resist by use of droplet emitting means, over the first pattern; etching the first pattern by use of atmospheric plasma; and ashing the first resist by use of atmospheric plasma processing means after etching the first pattern, wherein the source electrode and the drain electrode are formed by: selectively forming a second pattern including a metal material by use of droplet emitting means; selectively forming a first pattern including a metal material by use of droplet emitting means; selectively forming a first resist by use of droplet emitting means, over the first pattern; etching the first pattern by use of atmospheric plasma; and ashing the first resist by use of atmospheric plasma processing means after etching the first pattern, wherein the source electrode and the drain electrode are formed by: selectively forming a second pattern including a metal material by use of droplet emitting means.

Re claim 15, none of the prior art of record discloses the following limitations in combination with the rest of the limitations in the claims: wherein the gate electrode is formed by: selectively forming a first pattern including a metal material by use of droplet emitting means; selectively forming a first resist by use of droplet emitting means, over the first pattern; etching the first pattern by use of atmospheric plasma for carrying out local plasma processing; and ashing the first resist by use of plasma processing means for carrying out local plasma processing, after etching the first pattern, wherein the source electrode and the drain electrode are formed by: selectively forming a second pattern including a metal material by use of a droplet emitting means; selectively forming a second resist by use of a droplet emitting means, over the second pattern; etching the second pattern by use of plasma processing means for carrying out local plasma processing; and ashing the second resist by use of plasma processing means for carrying out local plasma processing, after etching the second pattern, wherein the droplet emitting means comprises a droplet emitting head in which a plurality of droplet emitting holes are disposed in a line form.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHANH B. DUONG whose telephone number is (571) 272-1836. The examiner can normally be reached on Monday to Friday from 8:00-4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith, can be reached on (571) 272-2429. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Zandra V. Smith/  
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2822

KBD